

Paper 1

Self-Selection into Contests: Theory and Experimental Evidence

This paper investigates to what extent individual self-selection into different markets can be explained by individuals' risk preferences, overconfidence and market expectations. In a laboratory experiment subjects choose to enter one of three markets. The markets vary in their degree of financial uncertainty because the number and the level of prizes are different across markets. After entering a market subjects compete in a contest for the given prizes. Depending on one of two treatments the contests are described by either a deterministic or a stochastic prize allocation rule. We show that sorting patterns lead to systematic differences in the composition of competitors between markets (market composition effects) and that risk preferences and overconfidence account for self-selection into the market with the highest financial uncertainty.

Incentives and Problem Uncertainty in Innovation Contests: An Empirical Analysis

Contests are a historically important and increasingly popular mechanism for encouraging innovation. A central concern in designing innovation contests is how many competitors to admit. Using a unique data set of 9,661 software contests, we provide evidence of two coexisting and opposing forces that operate when the number of competitors increases. Greater rivalry reduces the incentives of all competitors in a contest to exert effort and make investments. At the same time, adding competitors increases the likelihood that at least one competitor will find an extreme-value solution. We show that the effort-reducing effect of greater rivalry dominates for less uncertain problems, whereas the effect on the extreme value prevails for more uncertain problems. Adding competitors thus systematically increases overall contest performance for high-uncertainty problems. We also find that higher uncertainty reduces the negative effect of added competitors on incentives. Thus, uncertainty and the nature of the problem should be explicitly considered in the design of innovation tournaments. We explore the implications of our findings for the theory and practice of innovation contests.

Paper 2

Failure in Complex Social Networks

A class of inhomogeneously wired networks called “scale-free” networks have been shown to be more robust against failure than more homogeneously connected exponential networks. The robustness of scale-free networks consists in their ability to remain connected even when failure occurs. The diffusion of information and disease across a network only requires a single contact between nodes, making network connectivity the crucial determinant of whether or not these “simple contagions” will spread. However, for “complex contagions,” such as social movements, collective behaviors, and cultural and social norms, multiple reinforcing ties are needed to support the spread of a behavior diffusion. I show that scale-free networks are much less robust than exponential networks for the spread of complex contagions, which highlights the value of more homogeneously distributed social networks for the robust transmission of collective behavior.

Complex Contagions and the Weakness of Long Ties

The strength of weak ties is that they tend to be long—they connect socially distant locations, allowing information to diffuse rapidly. The authors test whether this “strength of weak ties” generalizes from simple to complex contagions. Complex contagions require social affirmation from multiple sources. Examples include the spread of high-risk social movements, avant garde fashions, and unproven technologies. Results show that as adoption thresholds increase, long ties can impede diffusion. Complex contagions depend primarily on the width of the bridges across a network, not just their length. Wide bridges are a characteristic feature of many spatial networks, which may account in part for the widely observed tendency for social movements to diffuse spatially.

Paper 3

The agenda-setting function of mass media

In choosing and displaying news, editors, newsroom staff, and broadcasters play an important part in shaping political reality. Readers learn not only about a given issue, but also how much importance to attach to that issue from the amount of information in a news story and its position. In reflecting what candidates are saying during a campaign, the mass media may well determine the important issues—that is, the media may set the “agenda” of the campaign.

The Threshold of Public Attention

The analysis reviews time series data for the period 1945 to 1980 on media coverage and corresponding public attention to a set of ten political issues including poverty, racial problems, Watergate, and Vietnam. The study focuses on the early stages of public awareness and the need for a “critical mass” or threshold to move a matter from the status of private concern to a public, political issue. The pattern of evolving public awareness varies dramatically for different types of issues. In some cases, the public appears to have a much steeper “response function” in reacting to real-world cues than the media; in other cases, the media seem to be more responsive. Modeling the growth of attention to public issues with the logistic curve met with modest success. The article

concludes with a call for much closer coordination between agenda-setting research and the study of political cognition.

Paper 4

Social network thresholds in the diffusion of innovations

Threshold models have been postulated as one explanation for the success or failure of collective action and the diffusion of innovations. The present paper creates a social network threshold model of the diffusion of innovations based on the Ryan and Gross (1943) adopter categories: (1) early adopters; (2) early majority; (3) late majority; (4) laggards. This new model uses social networks as a basis for adopter categorization, instead of solely relying on the system-level analysis used previously. The present paper argues that these four adopter categories can be created either with respect to the entire social system, or with respect to an individual's personal network. This dual typology is used to analyze three diffusion datasets to show how external influence and opinion leadership channel the diffusion of innovations. Network thresholds can be used (1) to vary the definition of behavioral contagion, (2) to predict the pattern of diffusion of innovations, and (3) to identify opinion leaders and followers in order to understand the two-step flow hypothesis better.

Diffusion of Innovations and Policy Decision-Making

This article presents a general mathematical model of the diffusion of innovations, which incorporates mass media and interpersonal influence. The model is applied to three classic diffusion data sets: (a) use of hybrid corn, (b) knowledge of Eisenhower's stroke, and (c) doctors' prescription of a new drug. Nonlinear regression is used to estimate the mathematical model. The results show that diffusion of hybrid corn occurred via interpersonal influence, whereas the diffusion of knowledge of Eisenhower's stroke occurred via the mass media. For the diffusion of the new drug, the model shows that doctors who subscribed to few medical journals learned about the drug primarily through interpersonal influence, while doctors who subscribed to many medical journals learned about the drug through both mass media and interpersonal channels. Policy decision-makers can use diffusion models to (a) evaluate the effectiveness of media versus interpersonal campaigns, (b) make comparisons between subgroups, and (c) evaluate the effect of a policy.

Paper 5

Standing on the shoulders of giants

Young scholars in academia often seek to work in collaboration with top researchers in their field in pursuit of a successful career. While success in academia can be defined differently, everyone agrees that training with a well-known researcher can help lead to an efficacious career. This study aims to investigate whether collaborating with established scientists does, in fact, improve junior scholars' chances of success. If not, what makes young scientists soar in their academic careers? We investigate this question by analyzing the effect of collaboration with a known-star on success of a young scholar. The results suggest that working with leading experts can lead to a successful career, but that it is not the only way. Researchers who were not fortunate enough to start their career with an elite researcher could still succeed through hard work and passion. These findings emerged from analyses of two discrete sets of well-known scholars on the career of newcomers, suggesting their strength and validity.

Superstar Extinction

We estimate the magnitude of spillovers generated by 137 academic “superstars” in the life sciences onto their coauthors’ research productivity. These researchers died while still being actively engaged in science, thus providing an exogenous source of variation in the structure of their collaborators’ coauthorship networks. Following the death of a superstar, we find that coauthors suffer a lasting 8 to 18% decline in their quality-adjusted publication output. These findings are surprisingly homogenous across a wide range of coauthor and coauthor/superstar dyad characteristics. Together, they suggest that part of the scientific field embodied in the “invisible college” of coauthors working in that area dies along with the star — that the extinction of a star represents a genuine and irreplaceable loss of human capital.